

WORKING GROUP ACTIVITY REPORT

Date: June 27, 2001

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- ARAC Issue: Transport Airplanes and Engines
- Working Group Name: Electrical Systems Harmonization Working Group
- Task Title: Task 1 – Electrical Generating and Distribution Systems
Task 2 – Electrical Bonding and Protection Against Lightning and Static Electricity
- Task Description: The following differences between FAR 25 and JAR 25 and their associated guidance material have been identified as having a potentially significant impact on airplane design and cost. The ESHWG will develop recommendations to harmonize these FAR and JAR requirements.

Task 1 – Phase 1: FAR and JAR 25.1351(b) currently have different requirements relating to generating system power sources, distribution busses and cables, and associated control, regulation and protection devices. FAR and JAR 25.1351(c) define minimum requirements for connecting external power to the airplane electrical power system, with additional parameters for external power protection listed in the JAR. FAR and JAR 25.1351(d) address alternate/standby power systems. FAR 25.1351(d) defines minimum requirements to enable safe operation in VFR conditions for a period of not less than five minutes to enable engine relight. JAR 25.1351(d), with its related ACJ, requires provision for a high integrity alternate/ standby power system with a duration for time limited systems compatible with JAR-OPS and ICAO Annex 8. This ACJ also provides Interpretive Material for non-time limited alternate/standby power sources and specifies services that must remain powered following loss of normal electric power.

Task 1 – Phase 2: The following FAR and JAR differences have been identified as having a lesser impact on airplane design and cost. FAR and JAR 25.1353(a) and 25.1431(d) address electrical interference on systems, with additional requirements contained in the JAR. FAR and JAR 25.1353(c) address control of storage battery charging. The JAR applies these requirements to all nickel-cadmium batteries, regardless of size or function, and adds requirements relating to maintenance of over-temperature sensing devices. FAR and JAR 25.1353(d) address electrical cable requirements, with the JAR containing additional requirements. FAR and JAR 25.1355(c) address electric power distribution. The JAR introduces Interpretive Material concerning segregation of electrical feeders to minimize the possibility of cascade or multiple failures. JAR 25X1360 addresses precautions against injury, with no equivalent FAR. JAR 25X1362 addresses emergency supplies for emergency conditions, with no equivalent FAR. FAR and JAR 25.1363 address testing criteria. The JAR contains additional criteria to be considered. The System Design and Analysis Harmonization Working Group (SD&A HWG) has proposed that the ESHWG harmonize and update 25.1310 (previously 25.1309(e) & (f)).

*TAE June Handout 25
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The TAEIG added two new tasks at the meeting on September 14 -15, 1999, which are to be included in the Task 1, Phase 2. They are FAR/JAR 25.869(a), which addresses fire protection of electrical system components and FAR/JAR 25.1357, which addresses requirements for electrical circuit protection devices.

Task 2: JAR 25X899 and associated ACJ 25X899 provide for consideration of electrical bonding and protection against lightning and static electricity. An equivalent paragraph does not exist in the FAR.

- Expected Product(s) NPRM ☒ AC ☒ Other ☒

- Schedule:

Task 1, Phase 1 – (Category 1 Items) (3 Items)

FAR/JAR: 25.1351(b), 25.1351(c), 25.1351(d)

Task 1, Phase 2 – (Category 1 Items) (12 Items)

FAR/JAR: 25.869(a), 25.1309(b)(amj), 25.1310, 25.1353(a), 25.1353(c)(5), 25.1353(c)(6), 25.1353(d), 25.1355(c), 25.1357, 25X1360, 25.1363, 25.1431(d)

Task 1, Phase 2 – (Category 3 Item) (1 Item)

FAR/JAR: 25X1362

Task 2 – (Category 1 Item) (1 Item)

FAR/JAR: 25X899

(NPRMs issued for FARs shown in *italics*)

	FAA Team	Working Group	TAEIG
1) Publication of the Federal Register Notice	Sept. 11, 1998		
2) Working Group Report(s) Complete		May 25, 2000	
3) Phase 2 Complete (TAE Approves WG Report)			September 13, 2000
4) TAE Submits Report to FAA			September 18, 2000
5) Phase 3 Complete (FAA Drafts NPRM)	10 Complete 7 Remaining (Apr. 20, 2001)		
6) NPRM Back to HWG	10 Complete 7 Remaining (Apr. 20, 2001)		
7) Phase 4 Complete (WG and TAE Approve NPRM Report) (Considered "Technical Agreement")		10 Complete (May 17, 2001) 7 TBD	6 NPRMs Issued (May 17, 2001) 11 TBD

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- Status – Convened nine meetings outlined below.

Meeting #1 – Long Beach, California; January 12-14, 1999

- A. Established working group policies.
- B. Drafted Work Plan defining task and working procedures.

Meeting #2 – London, England; March 30 – April 1, 1999

- A. Gathered background data on JAR 25.1351 and 25X899
- B. Drafted letter to TAEIG regarding categorization of assigned FAR/JAR paragraphs under "Fast Track".
- C. Began "Fast Track" work group procedures.

Meeting #3 – Seattle, Washington; July 6-8, 1999

- A. Began discussion on 25X899 with group divided into two positions.
- B. Compromise position on 25X899 was to be worked out by next meeting.
- C. Created first drafts of two Category 1 working group reports.

Meeting #4 – Hoofddorp, The Netherlands; October 19-21, 1999

- A. Completed first drafts of remaining Category 1 working group reports.
- B. Work group would review all report drafts to resolve any issues between fourth and fifth meetings.

Meeting #5 – Wichita, Kansas; November 30 - December 2, 1999

- A. Completed final drafts of all Category 1 FAR/JAR paragraphs.
- B. Submitted thirteen of sixteen reports to TAEIG at December meeting.
- C. Held back three reports for further review of cost impact statement.

Meeting #6 – Paris, France; February 15-17, 2000

- A. Finalized the remaining three Category 1 reports and submitted to TAEIG.
- B. Began identification of issues for the Category 3 item, 25X1362.
- C. Members would gather data on products from each company to help establish industry practice regarding subject addressed in 25X1362 in preparation for next meeting.

Meeting #7 – Ottawa, Canada; May 23-25, 2000

- A. Discussed all issues relating to 25X1362 and completed final draft of the working group report.
- B. Submitted final working group report to TAEIG.

Meeting #8 – Palm Coast, Florida; October 31 – November 2, 2000

- A. Reviewed drafts of NPRMs from FAA, which resulted from six working group reports and approved with few comments.
- B. Reviewed JAA draft of PNPA 25DF-317 which outlines JAA response to ESHWG working group reports.
- C. Noted possible "deharmonization" of 25.1310 due to FAA delay in issuing NPRM.
- D. Proposed three TORs for future ESHWG tasks and submitted to TAEIG for review and approval.

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Meeting #9 – Bristol, England; May 15 – 17, 2001

- A. Welcomed new member from Embraer and a new FAA focal to the working group.
- B. Reviewed drafts from FAA which resulted from four working group reports and approved with several comments.
- C. Co-chairs from the Wire Systems Harmonization Working Group (WSHWG) established by ATSRAC joined our meeting for one-half day to familiarize ESHWG with ATSRAC Task 6 and to establish working relationship. Schedule for both groups to meet concurrently was agreed upon to allow maximum coordination for completion of ATSRAC tasks.
- D. Began task of modifying draft AC 25.1351-1 to reflect proposed harmonization of FAR/JAR 25.1351 and associated ACJs. During discussion it was noted that in recent certification projects the FAA has written Issue Papers, Special Conditions, etc., that require compliance to standards even more stringent than the harmonized standards proposed by ESHWG for FAR/JAR 25.1351(d). Since the FAA has not completed the draft NPRM for FAR/JAR 25.1351(d), the ESHWG determined that further guidance on FAA policy regarding FAR 25.1351(d) is required.

- **Bottlenecks – None**
- **Next Actions –** Continue review of FAA drafted material relating to the remaining ESHWG harmonization proposals as they become available from the FAA. Continue review and update of Advisory Circulars AC 25-10, 25-16, and Draft AC 25.1351-1 to be compatible with newly harmonized FARs and recent FAA Policy Memos and Issue Papers. Coordinate proposed FAR material coming from WSHWG to create new harmonized FARs and ACs.
- **Future Meetings –** Next meeting date has been set for August 21 – 23, 2001, in Toulouse, France. This will include a joint meeting with WSHWG from ATSRAC. Additional joint meeting dates are planned for November 6 – 8, 2001, in Seattle; and January 28 – 30, 2002, in Paris, France.
- **Lessons Learned Discussion (at end of task) –** (1) Improved instructions are needed to help working groups address question #16 in the Working Group Report regarding economic impact of the proposed rule or advisory material. (2) Feedback is needed when working group submits comments to FAA drafted material to indicate FAA acceptance or other disposition of working group comments.
- **Request for TAEIG Action –** The ESHWG requests the TAEIG to formally authorize the new aging wire related tasks coming from ATSRAC that will have co-responsibility with ESHWG and WSHWG.